UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET- SUITE 300
DENVER, CO 80202-2466
Phone 800-227-8917
http://www.epa.gov/region08

Date: April 11, 2006

SUBJECT: Review of the "Design Modification for Use of Geosynthetic Clay Liner" at the CR Group Tekoi Balefill, Skull Valley Band of Goshute Indian Reservation, Tooele County,Utah

FROM: Randall W. Breeden, Geohydrologist
RCRA Corrective Action Program, Technical Support

TO: Susanna Trujillo, Tribal Liaison
RCRA Solid and Hazardous Waste Program

Per your request I have reviewed the report "Design Modification for Use of Geosynthetic Clay Liner" at the Tekoi Balefill, (May 2005, revised January 2006). In addition, I have reviewed the relevant sections of the Final Environmental Impact Statement for the Tekoi Balefill project developed by U.S. Department of Interior, Bureau of Indian Affairs, (May 2004).

In general, the proposed design modification to install a geosynthetic clay liner (GCL) to replace the two feet of compacted bentonite-enhanced native soil proposed as the original design is appropriate. Installation of an appropriate GCL should provide the same level of reduction in permeability as the two feet of compacted bentonite-enhanced native soil. However, the report is deficient in several areas, and leaves several questions unanswered that must be addressed prior to EPA approving or disapproving the proposed design modification. The following comments describe each deficiency, asks the question that needs to be addressed and states what to do in order to address that deficiency. If you have any questions, or need clarification on any of the comments, please contact me at 303-312-6522, or email breeden.randy@epa.gov.

Comments

- Appendix B contains a letter dated January 25, 2006 from Applied Geotechnical Engineering Consultants, P.C. to Kent Staheli. The third paragraph states, "This letter summarizes the laboratory tests conducted on samples of Wyoming bentonite to provide an indication of the geosynthetic clay liner compatibility with the project site". There are two issues concerning this statement. The first relates to the fluids used to conduct the Atterberg Limits tests. The letter goes on to state that: "the plasticity of the bentonite was tested using distilled water, "site" water obtained from monitoring wells at the project site and water leached from soil obtained from the site", and the Table included in the letter exhibiting the Liquid Limit and Plasticity Index support that that statement by only

showing the results for distilled water, "site" water and soil leached water. However, the first paragraph on page II-3 of the report states, "Compatibility tests were conducted by ACEC…. Using bentonite material used to manufacture the GCL materials and using "site" ground water obtained from monitoring well 1, leachate obtained by leaching water through the soils obtained from the site, and leachate obtained from the balefill leachate collection and removal system." In addition Table II-2 contains results that are identified as from actual balefill leachate. Why is there a discrepancy between the results contained in the design modification report compared to what is stated in the letter? Were tests conducted using actual leachate from the balefill, and if so, why were the results not included in the letter to Mr. Staheli? If no tests were conducted using actual balefill leachate additional tests using actual leachate should be performed. This discrepancy must be addressed.

- The first paragraphs on pages II-3 and II-4 both state that "bentonite material used to manufacture the GCL" was used to conduct the Atterberg Limits and the permeability tests." However, the letter states that "tests were conducted on samples of Wyoming bentonite to provide and indication of the GCL compatibility." There are several different type of Wyoming bentonite, so the question is: were the tests performed on bentonite that was provided by the manufacture of the GCL to be installed at the site, or was it simply a sample of a type Wyoming bentonite? If the bentonite used for the tests was not from the manufacturer, but rather just a sample of bentonite, then the chemical and physical characteristics of the sample used in the tests must be compared to those used in the manufacture of the GCL and provided for evaluation, otherwise the results from these tests are not representative and may not even be comparable to the bentonite used by the manufacturer. The report must include a discussion of the representativeness of the bentonite on which the tests were performed. This discrepancy must be addressed.

- The permeability test was only performed on the "site" water leached from the on-site soil. Why were no tests for permeability performed using actual leachate? The reasoning for conducting tests using actual leachate, is that if a leak occurs through the HDPE liner, leachate is what will come into contact with the GCL. Therefore, tests for permeability using actual leachate should be investigated. The report must address this issue.

- The report does not state the type, nor manufacturer of the GCL to be installed at the site. There are several manufacturers of GCLs, producing different designs of GCLs, all of which have different engineering properties and characteristics. The specific type used at a site depends on several factors such as, H:V slopes, normal loads placed on the liner and internal and interface shear strength requirements. Therefore, in order to evaluate the adequacy of a specific GCL at this site, it is imperative to know what type, and from which manufacturer will be installed. The report must include a discussion of the type of GLC that will be installed and explain why that type is appropriate given the conditions at the site (i.e. Bentofix - NWL, needle punch reinforced GCL where high internal strength as well as increased friction resistance interface shear strength against adjacent materials such as a geomembrane is needed). The report must also contain a copy of the manufacturer's specifications. If two different types of GCLs are to be used, then the

report must include a discussion of the appropriateness of each type. The report must include a discussion of the adequacy and appropriateness of each GCL used and include a discussion of QA/QC issues associated with all types used.

- Given that the GCL will lie conformably on top of the native soils, what preparation is necessary to ensure the integrity of the GCL in maintained? In other words, what are the geotechnical engineering specifications for the sub-grade, and what methods will be employed to attain those specifications. This is important since there will be no compacted native soil-bentonite enhanced layer. In addition, what QA/QC tests will be performed to ensure the sub-grade meets the specifications. What frequency will the QA/QC tests be performed, and who will evaluate the results of those tests.

- Who will provide third party oversight QA/QC? The contracting firm that installs the GCL should not be the firm that provides oversight QA/QC, that should be an independent third party firm. The report must state how third party QA/QC will be conducted and how issues will be resolved if they arise.